

25 FEB 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
11 March 2004 (11.03.2004)

PCT

(10) International Publication Number
WO 2004/020784 A3

(51) International Patent Classification⁷: **E21B 34/02**,
34/04, 34/06, F16F 9/34

(21) International Application Number:
PCT/EP2003/009698

(22) International Filing Date:
1 September 2003 (01.09.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
202 13 365.6 30 August 2002 (30.08.2002) DE

(71) Applicant (for all designated States except US): **COOPER
CAMERON CORPORATION** [US/US]; 1333 West
Loop South, Suite 1700, Houston, TX 77027-9109 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BIESTER, Klaus**
[DE/DE]; Am Maschsee 2, 29342 Wienhausen (DE).

(74) Agent: **HILGERS, Hans**; Grünecker, Kinkeldey, Stock-
mair & Schwanhäusser, Maximilianstrasse 58, 80538
München (DE).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

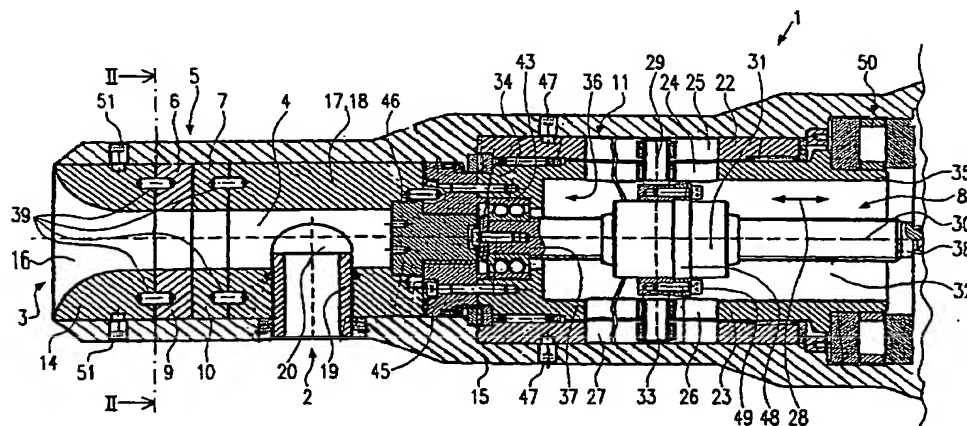
Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
6 May 2004

[Continued on next page]

(54) Title: **THROTTLE DEVICE**



(57) Abstract: A throttle device (1) comprises a device housing (15) with an inlet (2) and an outlet (3) and a throttle element (5) arranged in a connecting duct (4) connecting the inlet (2) and the outlet (3), said throttle element comprising at least two throttle components (6, 7) to be adjusted relative to one another and by the relative position of which an opening surface of the throttle element (5) is determined, at least the first throttle component (6) being actively connected with a drive means (8) for an adjustment relative to the second throttle component (7). In order to guarantee with a simplified construction a safe operation of the throttle device without the risk of a choking of the corresponding throttle element and to simultaneously realize a simple possibility of movement for the throttle components, the throttle components are throttling discs to be rotated relative one to another, at least one of which being movably connected with a rotary adjustment device (11) of the drive means (8), the throttling discs (9, 10) each comprising at least one throttle opening (12, 13, 40, 41) the overlap of which determines the opening surface depending on the relative position of the throttling discs (9, 10).

BEST AVAILABLE COPY

WO 2004/020784 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 03/09698

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E21B34/02 E21B34/04 E21B34/06 F16F9/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B F16F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 751 022 A (BAKER REUBEN C ET AL) 19 June 1956 (1956-06-19)	1-8,24, 25
Y	column 8, line 11 - line 24; figures 12,13 Claims 3,4,6,7,24,25 lack inventive step with regard to this document considered alone	9-23
X	US 2 920 863 A (WLADIMIR TIRASPOLSKY) 12 January 1960 (1960-01-12)	1-8,24, 25
Y	claim 1; figures 2,3 see disc 5 with ports 14 and ring 8 with ports 15 Claims 3,4,6,7,24,25 lack inventive step over this document considered alone	9-23
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

18 February 2004

Date of mailing of the international search report

24/02/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Tompouloglou, C

INTERNATIONAL SEARCH REPORT

Inventor's Application No
PCT/EP 03/09698

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 638 833 A (WOLCOTT II HERBERT A) 27 January 1987 (1987-01-27)	1-8,24, 26
Y	column 1, line 14 - line 25 Claims 3,4,6,7,24,25 lack inventive step over this document considered alone	9-23
Y	US 3 637 188 A (UNG HARRY L) 25 January 1972 (1972-01-25) see discs 33,34; nut 34 figure 1	9-23
Y	GB 625 698 A (WILLIAM EDWARD KENDRICK; SYDNEY EWART BULLOCK; THOMAS HAMILTON FAULKNER) 1 July 1949 (1949-07-01) the whole document see sleeves 105,143 and spindle 16S	9-23
Y	GB 925 787 A (HYDREL AG) 8 May 1963 (1963-05-08) see spindle 20 figure 1	14-16
A	US 2 952 494 A (FRANCOIS ROUVIERE ROGER ET AL) 13 September 1960 (1960-09-13) see discs 6,7,14,15 figures 2,3	1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/09698

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2751022	A	19-06-1956	NONE	
US 2920863	A	12-01-1960	NONE	
US 4638833	A	27-01-1987	NONE	
US 3637188	A	25-01-1972	CA 923013 A1 FR 2075507 A5	20-03-1973 08-10-1971
GB 625698	A	01-07-1949	NONE	
GB 925787	A	08-05-1963	NONE	
US 2952494	A	13-09-1960	NONE	